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ment in the preparation of such bibliographies and subjects for digesting, thus eliminating the features less pertinent to the teachers and schools of their States.

CONCLUSION.

To accomplish much of this means that Surveys should employ geographers, or the best trained men that may be secured. Where this is not feasible, the coöperation and part-time assistance of men in teaching positions would be of advantage.

The outlook is encouraging, particularly where Surveys are broadening their scope by giving attention to industrial and economic activities, and by directing investigation in phases of natural history. Regional geography is thus intensified, a work which should precede a well-founded systematic geography, because a satisfactory system presupposes a consideration of a high percentage of the facts which the system would compass.

Even the little that is being done by the least affluent of our Surveys furnishes data and opportunity for advancing better methods in geography. All that is needed is an amplification of work in few lines; an emphasis wherever the schools may be reached, both in instructing and inspiring the teachers and by supplementing the outfit of the class-room; and a correlation of data produced by the Survey, and, to as great an extent as is practicable, by other similar organizations.

THE DEMARCATION OF THE ALASKA BOUNDARY.

A paper on the progress of the Alaska Boundary Survey, read by Mr. O. H. Tittmann on April 24, before the American Philosophical Society, has been reprinted from its *Proceedings* (Vol. xlvii, 1908). The total length of the boundary between Canada and Alaska is 1,200 miles, naturally divided into two sections of about 600 miles each. One is the section bounded by the 141st meridian, concerning which there has been no dispute; and the other is the part of the boundary that delimits the stretch of coast extending from the neighbourhood of Mount St. Elias southeasterly to and through the Portland Canal. This was happily settled by the Tribunal of London in 1904.

Mr. Tittmann, representing the United States, and Mr. W. F. King, on behalf of the British Government, were appointed commissioners to delimit the part of the boundary that had been in dispute. They at once entered upon their duties guided by maps on which the Tribunal had marked certain mountain peaks as the mountains contemplated by the Treaty of 1825. Mr. Tittmann gives the following summary of the progress of the work:

"It is the business of the commissioners to identify the peaks, to establish their geographical position, to mark by visible monuments, wherever possible, the turning points in the line and such other points as may be necessary, and to describe and define the line between the points selected by the Tribunal. There was a stretch of about one hundred and twenty miles where the topographic information was insufficient, and there the commissioners were directed to make additonal surveys and to select mountain peaks within certain prescribed limits to define the boundary. The commissioners decided to mark at once certain river crossings and the mountain passes and to connect all the boundary peaks by a continuous triangulation based on the trigonometric datum adopted by the Coast and Geodetic Survey for southeastern Alaska.

"The boundary line, starting from the neighbourhood of Mount St. Elias, crosses that summit and other high peaks of the St. Elias Alps and the Fairweather Range. In general, it lies amid perpetual snow and ice except when it drops abruptly into the river valleys only to rise again into regions of perpetual snow. Finally, it reaches the head of Portland Canal and becomes a water boundary.

"In the four years since work was begun on this portion of the boundary the commissioners have fixed trigonometrically all the peaks except two near Mount St. Elias and those in the region between the Whiting River and Devil's Thumb, and some of the peaks south of the Unuk River. The passes, valleys and river crossings have been monumented with the exception of the crossing of the Alsek in the north and the valleys of the affluents of the Iskut and the crossing of the Le Duc and Chicamin rivers in the south. The turning points of the water boundary in Portland Canal also remain to be fixed by reference to points on shore."

According to the Treaty of 1825, the 141st meridian west of Greenwich forms the eastern boundary of Alaska from the Arctic Ocean to near Mount St. Elias. In 1889, twenty-two years after the United States had acquired Alaska, our Government took the first steps towards establishing the location of the 141st meridian on the ground. The Coast and Geodetic Survey sent parties to the Yukon and Porcupine rivers to determine the boundary crossing of those rivers. The Canadian Government had sent an engineer to the Yukon in 1887 to make an astronomical determination of the boundary. The surveyors were compelled to determine the longitude by lunar culminations and occultations, and the American parties spent a whole winter in observing them. The work of the three parties, however, was not carried on under an international agreement, and the results, therefore, were not reciprocally binding upon the two Governments.

The discovery of gold and the general development of that region, however, led to the construction of a Canadian overland telegraph line to Dawson and beyond, and, later, the United States laid a cable from Seattle to Sitka and thence to Valdez on Prince William Sound, whence an overland line was built by the United States War Department as far as Fort Egbert on the Yukon, near the boundary.

This important auxiliary to longitude determination made it possible for the two Governments to determine the position of the 141st meridian with all the necessary accuracy as soon as an agreement was reached and embodied in the treaty signed at Washington in August, 1906. This treaty provided for the survey and demarcation of the line, and before the end of that summer the telegraphic determination of the Yukon River crossing of the 141st meridian had been completed. The telegraphic determination made by the Americans rests on the known longitude of Seattle. Signals were exchanged between Sitka and Seattle, Seattle and Valdez, Valdez and Fort Egbert, Fort Egbert and the boundary. That made by the Canadians rests on the longitude of Vancouver, between which place and the boundary time signals were exchanged. As the difference between Seattle and Vancouver was also determined by the commissioners, the circuit was closed and a very satisfactory agreement was obtained.

Mr. Tittmann adds that in order to avoid all questions that might arise from local deflections of the zenith, it was provided by the Treaty of 1906 that the commissioners should determine by the telegraphic method a convenient point on the 141st meridian and then trace a north and south line passing through the point thus ascertained. This provision fixed the telegraph crossing of the boundary as the initial point for the longitude determination. The commissioners desired to make the determination as nearly on the 141st meridian as possible, in order to avoid a deflection error which might have been involved if the longitude had been obtained by linear measurement from a longitude observed at some distance from the boundary. The transit pier erected for the purpose of exchanging time signals was found to be in longitude 141° 00′ 00″ .4, a very close hit. It is interesting to note also that the final longitude differed only 9″.43 of an arc, or 410 feet, from that derived by moon culminations about twenty years before.

The work of tracing the boundary southward from the Yukon was begun in the spring of 1907 and was carried southward a distance of about one hundred and twenty miles. Aluminum-bronze monuments were erected on the north and south banks of the river, a trigonometric and topographic survey was made extending two miles on each side of the boundary for a distance of about forty-five miles, and a broad vista was cut through the woods for the same distance. The work planned for the coming season will carry the tracing of the line as far as the great mountains south of the White River, and the topographic survey and the monumenting will be pushed until the severity of the weather compels the surveyors to abandon the work and turn their faces homeward.

ORIENTATION OF MAPS.*

BY

F. P. GULLIVER.

OBJECTS OF PAPER.—From a study of the present conditions in elementary schools, the writer has come to the opinion that one of the fundamental difficulties in obtaining a clear idea of what a map represents lies in the fact that many of the maps first shown pupils have various orientations. He believes that if the north point on all maps were always placed at the top of the page much less difficulty would be experienced in teaching pupils to realize clearly that a map represents a certain definite portion of the surface of the earth.

If all maps followed the same rule in regard to their orientation there would be fewer adults who would say, as so many do to-day, "Oh, I cannot use a map, for it does not mean anything to me."

Children are taught their letters and are then taught to read words on the printed page. Children are also taught musical notes by ear and are then taught to read these musical notes from the printed music. In the same way children should be taught to see a certain portion of the surface of the earth, and then should be taught to read similar facts from printed maps. Books are printed with a definite orientation of letters and words; music is also printed

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* Read before the Association of American Geographers, January 1, 1907.